Metaphor and Meaning

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Introduction

Any dictionary will quickly confirm that most of the words which we recognise as straightforward and literal are dead (or "frozen") metaphor. Moreover if one attends carefully to the sentences of any fluent speaker one finds that they contain a steady stream of metaphors. The fluid boundaries of language surround us. Typically, however, the metaphors of ordinary discourse are transparent, so we pay little or no attention to the metaphorical character of ordinary discourse and the role that metaphor serves. However, while metaphor should be a central part of any inquiry which purports to provide a general explanation of language and communication, the important puzzles about language and meaning which metaphor raises are frequently treated as a peripheral issues in semantic theory, if they are mentioned at all. A central aim of this paper is to redress this neglect and to delineate the central role which metaphor plays in semantic evolution. Contemporary philosophers of language who are exceptions to the general pattern of neglect include Davidson (1978), whose deflationary view is that that there is no special category of metaphorical meaning distinct from literal meaning, and Searle (1979).

Everyday metaphors are invisible because we understand them immediately, and therefore have no need to pay attention to their metaphorical character. Metaphors by and large are conceived and grasped with the same facility as our ordinary literal vocabulary. There is no problem in understanding metaphors: the problem is to explain *how* we understand them.

Divergent Conceptions of Metaphor

Metaphor has long been treated with both veneration and suspicion. Thomas Hobbes (1651: Part 1, Ch. 4) identified the use of metaphor as one of four cardinal abuses of language and his misgivings about the power metaphor has to obfuscate and corrupt thinking have been characteristic of the empiricist tradition which he helped to inaugurate.

According to the empiricist view championed by Hobbes metaphor is at best an ornament to language. While metaphor may help us to express ourselves more forcefully or more colourfully, Hobbes and his successors claimed that it is an ornament fraught with dangers, and if we are to express ourselves as rational thinkers metaphors are best eschewed. Metaphor, on this view, is a dangerous deviation from the reliable literal resources of natural language and we should restrict ourselves to these literal resources in the systematic pursuit of truth. A precursor of this view can be found in Plato, who castigated the poets and playwrights for the distortions which they generated through what he regarded as a systematic misuse of language (Murdoch 1977).

In contrast, there is a conception of metaphor as the fountain of meaning and truth. Nietzsche argued that metaphor plays a foundational role in human understanding, and that any satisfactory account of language must appreciate its place (Cantor 1982). Nietzsche actually seems to have accepted Hobbes's views about the inevitable distortion of metaphor, but unlike Hobbes denied that truth could be apprehended through non-metaphorical thought. Giambattista Vico, like

Nietzsche, gave metaphor a primary role in understanding, but saw it as a creative force, not an impediment to our understanding of the external world (Danesi 1987).

Both the veneration and repudiation of metaphor are overreactions, though I think that Nietzsche was closer to the truth. In particular Nietzsche was right in claiming that metaphor has a central role to play in the way we make sense of the world. However I will also defend the seemingly conflicting claim that we can provide cognitively equivalent literal translations which express the content of all metaphorical statements. Understanding how metaphor is both essential to creative thought and also in a sense eliminable helps to deepen our understanding of its nature and its role in language.

Metaphorical Generalisation

The use of metaphor is a dynamic phenomenon which enables us to generate new meanings from old. This process can be illustrated with the phenomenon of metaphorical generalisation. The view that metaphor is a principal avenue by which language progresses is based on the perfectly reasonable assumptions that language has to start somehow, and its initial concerns would have been with items in a speaker's immediate vicinity. A plausible origin myth is that the most primitive linguistic resources provided rudimentary verbal representations for solid sensible objects and for animal and (especially) human activities (Stanford 1936). Initially the resources of natural language would presumably have been fairly parsimonious. A problem is: how could the primitive linguistic resources, grounded in representations for sensible objects and expressions for basic activities, be extended to embrace the higher reaches of abstract thought that we now articulate through the rich resources of natural language? A fundamental mechanism for extending and refining language is metaphor.

Consider the verb 'run'. In its simplest and most basic sense it designates a human (and animal) activity. But through metaphorical extension it comes to be applied to objects which lie outside its basic reference class, such as rivers. The term began with a more limited scope or extension, and when talk first arose of rivers running it must have sounded bizarre. It might well have been objected, when the metaphor was green and fresh, that rivers cannot run: they have no legs. This is a banal example of so-called frozen (or dead) metaphor. Once metaphor freezes (or dies) it becomes an ordinary part of our literal vocabulary. So it comes about that rivers run, taps run and fences run, and they 'run' in a way which has generalised the meaning of this expression.

When we speak of fences 'running' around a boundary, for example, there is no suggestion of motion. The metaphor has generated a static sense of 'running'. Running has acquired the sense of following a path. That has amplified one aspect of the original idea of running, and suppressed other elements. Running is a simple activity which involves putting one leg in front of the other in a certain systematic, sequential and rhythmic fashion. It is a basic activity, but one nevertheless with complicated aspects, and by abstracting certain elements of the activity we are able to produce a generalisation of the basic sense of the word.

Metaphorical extension in this way, starting from the modest beginnings of describing macroscopic objects and simple activities, forges and reshapes concepts and thereby modifies language so that it comes to embrace an ever wider and more complicated repertoire of referents and activities. This process or generalisation and abstraction is a plausible explanation of how it is that we are able to start off with a decidedly limited or restricted set of verbal resources and extend them further, and reshape and refine them, to cope with the ever more complicated world which these very resources help us to create.

Semantic Depth

Metaphor, then, is not an alternative way of expressing common sense but a common way of achieving new sense. But how does metaphor change meaning? And why is the process problematic? A basic puzzle is that metaphors are typically literally false. Yet clearly there is some sense in which they are not only *not* false, but can provide very valuable insights. But how can a sentence provide important insights if it is false? Evidently there must be some internal or underlying complexity which will explain this.

Expressions surely must have a deep as well as a surface level. It is at the surface level that we recognize the falsehood of the metaphor. Consider the example (taken from Searle 1979) 'Richard is a gorilla'. We apprehend immediately that this sentence is not literally true. Indeed if Kripke (1980) is right about the meaning of natural kind expressions, not only is Richard *not* a gorilla, he is *necessarily* not a gorilla. How can a *necessarily* false statement provide us with an interesting and possibly useful insight?

The answer presumably is that the words have more complex structure than a naive Fregean account might lead us to believe, and this structure is revealed by the possibility of metaphorical use. Expressions may have a primary sense and a primary reference, but metaphorical use is able to activate secondary sense, and thereby generate a new extension for the expression. These subsidiary ideas and associations show that in addition to a primary sense and reference there is also a penumbra of additional associations or meanings. When the literal meaning is deactivated, because of the falsehood of the sentence, a switching happens and the secondary meanings latent in the penumbra are activated.

It will have been noted that I have been producing a steady stream of metaphors in the process of explicating metaphor. There is nothing viciously circular or objectionable in this procedure. In the case of metaphor, explication need not involve elimination.

The penumbra of associated secondary meanings is extremely interesting. Suppose that Mabel is a gorilla in the local zoo. When we say that Mabel is a gorilla, the associated meanings do not intrude at all. But when we apply the description to the man Richard, something interesting happens. As soon as we apprehend that the description is literally false, which usually happens immediately and unconsciously, the expression becomes semantically charged with secondary meanings latent in the associated semantic penumbra. Metaphors work typically by activating these subsystems of associations described by Black (1962), as a 'system of associated commonplaces', and by Mill (1875: Book I, Ch. 2, §5) as 'connotations'.

Another interesting fact is that the associated commonplaces are often not literally true of the objects from which they are derived. To describe someone as a gorilla might be to suggest that they are large, clumsy, hairy, and perhaps unpleasantly fierce or aggressive. That is one possible interpretation of this metaphorical description. But, thanks to ethologists such as Dian Fossey (1985), we know that gorillas in fact are quite gentle creatures, and by no means clumsy. What is important for the effectiveness of the metaphor is not what is true about gorillas, but rather the associated conceptions, or misconceptions, about gorillas.

These commonplaces or associations have a habit of hanging around, even after the literal meaning has changed. To be in a political wilderness is not to be in a pristine, unspoiled place of great natural beauty. Even a person who knows what gorillas are really like, may use and understand that word metaphorically in a way which respects not the actual characteristics of gorillas, but the common

prejudices that are associated with them.

There are, in short, commonplaces or connotations associated with a large number of expressions, and this constellation of associated ideas provides the semantic charge which explodes when the expression is used metaphorically.

Figures of Speech

Metaphor is one of a number of so-called figures or speech or tropes, the study of which has, thanks to the onslaught of Hobbes and his empiricist successors, largely dropped out of the curriculum. Simile is an important and closely related figure of speech which, it has been suggested, can help us to understand metaphor. Hobbes thought that *all* metaphor, not just objectionable cases such as mixed metaphor, was to be eschewed. It is a flaw, he seems to have thought, in the glass of language. There is an elaborate taxonomy of metaphorical tropes which used to be part of the subject 'rhetoric' which includes 'simile', 'synecdoche', 'metonymy', 'catachresis', 'zeugma' and more. Metaphor is the genera of which these are species and here I am principally concerned with the genera.

Simile is used to draw attention explicitly to a similarity or likeness shared by two individuals. It has been argued, for example by Richards (1936), that metaphor can be explained in terms of simile. On Richards' view 'Richard is a gorilla' is just equivalent to 'Richard is *like* a gorilla'. There are fatal objections to this proposal. One is that likeness or similarity is too weak a relation to explain any effective figure of speech. Everything is similar to everything else in some respect, if only in that everything has the property of being self-identical. Mere likeness is therefore unhelpful: we need to specify likeness *in some particular respect*. So if Richard is like a gorilla, we need to understand in what respect, or under what aspect, this likeness holds. And that is going to come from the penumbra of associated meanings. It turns out therefore that simile is on all fours with metaphor and works in a similar sort of way. But simile does have an advantage in that it is by use of explicit simile, such as 'Richard is *fierce* like a gorilla', that we are able to unpack metaphor. So simile can be extremely helpful in the important task of providing a paraphrase, or homophonic translation, of metaphorical expressions.

Another related figure of speech is allegory. Allegories are metaphors writ large. There is a spectrum of cases and metaphors can be graded from the simple to the very complex. Interesting metaphors are ones which require unpacking, and which contain layers of complexity and detail not obvious on first reading. Parables and fairy tales are often moral metaphors: they point to deep truths about human experience and behaviour. That typically involves the uncovering of certain fundamental likenesses or resemblance.

The whole process of thinking is based on the perception of similarity, and difference, and metaphor is a fundamental tool which we use for the purpose of exploring similarity and difference. Analogy often spells out the model in great detail—parables which take the form of a story are an example. The story is not a simple piece of descriptive narrative; good stories, and indeed good historical narrative, is never just that. It points beyond from the particular to more general features of the human situation. It reaches from its particular circumstances to encompass wider domains of phenomena.

Dormant Metaphor

The difference between live and dead metaphor is that dead metaphor is just an ordinary part of our literal vocabulary and quite properly not regarded as metaphor at all. There is an intermediate category which can be called 'dormant'

metaphor, which consists of expressions which we use without being conscious of their metaphorical character, but if we attend to them we can see at once that they unmistakable metaphors. These are metaphors in the process of expiring. Dormant metaphors can be found lurking in virtually every interesting sentence.

Live metaphor is metaphor which we are conscious of interpreting. 'Richard is a gorilla' obviously cannot be taken at its literal face value. Metaphors like this have to be attended to and decoded. There is a fuzzy boundary between dormant and dead metaphor. Whereas dead metaphors are not recognisable as metaphor at all, dormant metaphors are expressions used unselfconsciously as part of our literal vocabulary, although when we take note of them it is evident at once that they cannot be straightforwardly literal. Metaphors which suffer the abuse of overuse, such as 'the bottom line', 'level playing field' degenerate into cliché, which is one process by which a living metaphor can expire.

Dormant metaphor can often be revived easily enough. One notorious way in which their metaphorical character can be resuscitated is when they are used in conjunction with other metaphors, producing mixed metaphor. The conjunction of disparate metaphors is curiously prevalent in political rhetoric, as in the examples (recorded in Fowler 1965) "we will not be stampeded into stagnation", or "the honourable member is leading us over the precipice with his head in the sand". These lamentable examples of mixed metaphor produce a disconcerting effect. They are juxtapositions of ideas which might have been descriptively effective used separately but in conjunction produce an ugly result. Mixed metaphor is in general to be eschewed on aesthetic grounds. It generates distracting images or ideas which subvert discourse instead of facilitating it. But an inappropriate sense can be activated by literal contexts as well as by other metaphors, as in former US President Gerald Ford's immortal observation: "Solar technology cannot be introduced overnight".

Paraphrase

Is it always possible to provide an equivalent literal paraphrase for metaphorical expressions? The paraphrase thesis is the view that the answer is in the affirmative: anything which can be stated metaphorically can be restated literally. This is a controversial and contested claim. Many writers feel that there is something special about metaphorical expressions that cannot be captured by any allegedly equivalent literal paraphrase. The dispute is unfortunately muddied by a failure to distinguish between affective and aesthetic aspects of metaphor and their descriptive or cognitive content.

Certainly metaphor is a basic ingredient in the tool-kit of poets and creative writers. Metaphors are a vital resource for the task of articulating novel insights into the human condition or refining old ones. An essential part of poetic expression is capturing something recognisably universal through an image which is concrete and particular. The concrete image provides a vehicle for the expression of something general. Metaphor is an essential device for performing this distinctive but important task. However there is a further and separate issue about what is actually conveyed by the use of a particular metaphor. I suggest that the *cognitive* or *descriptive* content can always be captured, up to any appropriate or desired precision, by a literal paraphrase. The following argument, I suggest, supports the paraphrase thesis.

First, the possibility of paraphrase is a condition of significance. Consider this claim with respect to literal expressions. You may be uncertain whether someone has understood what you have said if they just repeat your words verbatim. Indeed simple repetition of words provides an opportunity for cleverly simulating understanding, as in Joseph Weizenbaum's (1976) computer program ELIZA. To

check if comprehension has been achieved we require paraphrase. If someone is able to transform our sentences into different but synonymous sentences, then we can be reasonably confident that our meaning has been grasped. This is clear in the case of understanding foreign languages. We accept that someone understands Chinese, for instance, if they are able to provide accurate translations of Chinese sentences. We can adopt acceptability to fluent bilingual speakers as a criterion of accuracy. But homophonic translation, or paraphrase, is also the criterion by which comprehension can be tested within a language. To understand an expression, literal or metaphorical, one must be able to provide a homophonic translation, or paraphrase.

This claim is usually attacked by counterexample. Consider again 'Richard is a gorilla'. Let us interpret this as the claim that Richard is offensively aggressive. Suppose it is objected that this paraphrase is unsatisfactory. Then the onus is on the objector to explain in what respect the paraphrase is unsatisfactory or falls short. But in the process of explaining the inadequacy of the proposed paraphrase, the critic is providing the means of improving and extending it. So by successive steps one of two things is going to happen. Either we will eventually reach a perhaps lengthy paraphrase which the critic admits captures the meaning of the metaphorical expression, or the critic will say that the paraphrase will not do, but cannot provide any explanation as to *why* it will not do. In the latter case whatever is not captured by the paraphrase turns out to be quite ineffable.

Perhaps the ineffable plays an important part of the way which we think about some things, but it is admitted as a boundary to our understanding not part of that understanding which we can assess and refine. Hence the qualification that paraphrase can always be provided for the cognitive element of metaphor, even though there may be important affective or aesthetic aspects of metaphor—vital for the visceral power of language which is so important for poetry—which our paraphrases are powerless to capture. How we *feel* about a metaphor—our affective response to a powerful image, for example—will not be duplicated by the paraphrase. But that is not a descriptive element of metaphor, which is all that we can expect to be reproducible by paraphrase.

Synaesthesia

A difficult challenge to the paraphrase thesis comes from so-called synaesthetic metaphors, which are metaphors which cross sense modalities. Sometimes the resultant metaphors are ones which seem completely incomprehensible. Fritz Kreisler, for example, once confessed how, "in a mood of irritability and ill temper", he bought a coat "in the colour of C sharp minor". This caused some alarm to those who saw him, and to reassure them he had "a collar in E flat major sown on to it" (Taylor 1963, p. 62). I cannot interpret my colour experience in terms of musical keys. Certainly there is difference in mood or feeling which we typically associate with musical keys, but nothing which provides (or at any rate which provides me with) any structuring of the colour spectrum.

I don't know whether Kreisler's remark is semi-serious, which exposes a dimension of meaning blindness in me, or whether it is intended to be pure nonsense, which to me is the most natural interpretation. Perhaps some musicians find Kreisler's remark intelligible. But this shift from the sense modality of hearing to sight is one which leaves me bewildered and I am completely at a loss to provide any sort of paraphrase. And the fact that I can provide no sort of restatement whatever is, I have suggested, an indication of absence of understanding.

Taking a less intractable synaesthetic case, suppose we describe someone's voice as 'cold'. This involves appropriating a term of kinaesthetic temperature discrimination, and applying it to the modality of hearing. Perhaps this is a case of dormant metaphor, and they are ones which we interpret without difficulty. Only when we reflect on the expression do we recognise its metaphorical character. We usually don't attend to them just because their meaning is quite clear. What it means, I suggest, is that the expression in the voice is rather unattractive, uninviting, unemotional, detached, stand-offish, ... I need not attempt to complete the paraphrase, anticipating that any reasoned rejection of its adequacy will provide the means for its correction and improvement to any desired level of precision.

Here, as before, we often find ourselves using metaphor to explicate metaphor. There is nothing objectionable or circular in that procedure. It is best however to choose metaphors whose meaning is clear and stable, and that will normally involving the use of dormant metaphor or literal vocabulary and other dead metaphors. Using live metaphor may just complicate the situation by leaving us with an explication which is itself is ambiguous or unclear and itself in need of paraphrase.

Metaphorical Insight

Although I claim that we always provide a satisfactory paraphrase for the descriptive elements of metaphors, they nevertheless perform an indispensable cognitive role which cannot be adequately filled by literal use of language. While we can always produce a paraphrase, the paraphrase is supplied *ex post facto* (retrospectively) and in a large class of important cases could not have provided the insight which the metaphor provided us with. This is because metaphors play a vital role in helping us to make sense of unfamiliar situations. To appropriate an image from Wittgenstein (1961, 6.54) metaphor is a ladder of cognitive ascent which can be kicked away after the vista it has exposed is revealed.

Consider the following story, taken from Donald Schon (1963). Schon noted that when someone thumped on the wall of a steel hut which he occupied it produced an unexpectedly loud reverberation. When this happened it triggered the thought: 'The room is a drum'. The drum-like characteristics of the room were perceived simply on the basis of its acoustic properties. But having made the association in virtue of its unusual acoustic behaviour, Schon went on to note that it was drum-like in a number of other respects. The room was hollow, cylindrical, with thin membrane-like walls which reverberated when struck.

The unfamiliar situation which he encountered had been structured and categorised usefully, and the metaphor provided a framework for understanding and exploring a novel situation. The metaphorical association provided a conceptual seed from which a more detailed description of the room could grow, helping to explain a number of features which were formerly puzzling. Without the 'drum' metaphor, it is virtually inconceivable that the room would have been conceptualised and understood in just that particular way. But as soon as the room was interpreted with the help of a useful metaphorical frame, insight and understanding of its unusual characteristics immediately followed.

That is a relatively trivial but nevertheless representative example. There are parallel and more significant cases in scientific explanation. To say 'electricity is a fluid' helps us to understand it better. We can liken voltage to pressure and current to flow. When not much was known about electricity, the better understood domain of fluid dynamics provided an interpretive framework which helped to develop understanding, and to explore and make sense of the then novel phenomena. Metaphors can always be paraphrased—*ex post facto*—but

they nevertheless play an indispensable role in providing a structured framework for interpreting and understanding a domain of unfamiliar or novel phenomena. There may also be a significant role played by metaphors in the process of scientific discovery. A well-known instance is the story of Kekulé, whose image of a snake grasping its tail provided him with a metaphor which helped him to elucidate the structure of benzene. It is likely that there are many similar cases of the use of metaphor which are unrecorded because, with some notable exceptions, scientists report their discoveries rather than the process which led to them.

Another interesting example is the theory of evolution by natural selection. According to popular legend the theory occurred to Darwin after he had been reading Malthus. That account, however, is based on a tidied up autobiographical homily which he wrote for his grandchildren (Darwin 1887). Stephen Jay Gould (1993, Ch. 9) suggests that the real inspiration for the theory came from another celebrated economist, Adam Smith. Smith proposed a famous model for providing the best economic arrangements for a society: the free market, which he explicated with the help of another celebrated metaphor, the 'invisible hand'. Smith notoriously argued that if you simply allow everyone to selfishly pursue their own interests you will produce the best possible outcome of distribution of goods and services for all. Markets left alone spontaneously ensure optimal economic arrangements.

Darwin, on Gould's interpretation, appropriated Smith's model, and adapted it to the biological world. If you think of organisms as individuals pursuing their own reproductive advantage, that is going to generate the most optimal biological outcome. Adam Smith's economic metaphor, applied to the biological world, provides an interpretive framework in terms of which the biological world can be described and understood. Like any systematically developed metaphor the Darwinian application has its limits and is liable to generate implausibility or nonsense if stretched beyond them. David Stove (1995) provides a cautionary check to vaulting Darwinian ambitions.

Gould also points out that there is a nice irony in the fact that Smith's model does not work very well for the economic world, though it does seem to be fairly successful in describing the biological world. That is another interesting fact. Metaphors are expressions which have been taken to a new home, and it may happen that they get on better in their new home than they did in their old one. It is also possible for metaphorical expressions to revert to their former literal meaning.

Conclusion

Metaphor is a tool of conceptual economy, but that does not exhaust its role. It is also a tool of discovery, providing a way of imposing or discovering structure within novel or unfamiliar situations. I have argued nevertheless that the fruits of such discoveries can be restated in non-metaphorical terms. Metaphor is also an important means by which language develops, but again we can provide literal paraphrases of what metaphors convey, at least insofar as we are concerned with their cognitive content. Metaphor may be an ornament to language but it is not *merely* an ornament and, *pace* Hobbes and Plato, it need not subvert communication and obfuscate meaning. There is little to be said for restricting our resources to only the drab modes of purely literal description. Language would certainly be much duller, and would more importantly have been unable to develop its complex and powerful resources of generalisation and abstraction without the resources of metaphor.

References

Black, Max. 1962. 'Metaphor'. In *Models and Metaphors: Studies in Language and Philosophy*. Ithaca: Cornell University Press.

Cantor, P. 1982. 'Friedrich Nietzsche: The Use and Abuse of Metaphor'. In *Metaphor: Problems and Perspectives*. (ed.) D.S. Miall. Atlantic Highlands, N.J.: Humanities Press, pp. 71-88.

Danesi, M. 1987. 'A Vichian Footnote to Nietzsche's View on the Cognitive Primacy of Metaphor: An Addendum to Schrift', *New Vico Studies* 5: 157-164.

Darwin, Charles. 1887. *Life and Letters of Charles Darwin*. London: John Murray.

Davidson, Donald. 1978. 'What Metaphors Mean', *Critical Inquiry*, 5 (1978): 31-47; reprinted. in *On Metaphor* (ed.) Sheldon Sacks (Chicago: University of Chicago Press), pp. 29-46.

Fossey, Dian. 1985. *Gorillas in the Mist*. London: Penguin Books.

Fowler, H.W. 1965. 'Metaphor', in *A Dictionary of Modern English Usage*. (ed.) Ernest Gowers. Oxford: Clarendon Press.

Gould, Stephen J. 1993. *Eight Little Piggies*. London: Jonathan Cape.

Hobbes, Thomas. 1651. *Leviathan*. (ed.) John Plamenatz, London: Collins, 1962.

Kripke, Saul. 1980. *Naming and Necessity*. Oxford: Blackwell.

Mill, John Stuart 1875. *A System of Logic*. 9th edn. London: Longmans, Green, Reader & Dyer.

Murdoch, Iris. 1977. *The Fire and the Sun*. Oxford: Clarendon Press.

Richards, I.A. 1936. *The Philosophy of Rhetoric*. Oxford: Clarendon Press.

Schon, Donald. 1963. *The Displacement of Concepts*. London: Tavistock.

Searle, John. 1979. 'Metaphor'. In *Metaphor and Thought*. (ed.) Andrew Ortony (Cambridge: Cambridge University Press, 1979) pp. 92-123.

Stanford, W.B. 1936. *Greek Metaphor*. Oxford: Blackwell.

Stove, David. 1995. *Darwinian Fairytales*. Aldershot: Avebury.

Taylor, Ronald. 1963. *Hoffmann*. London: Bowes & Bowes.

Weizenbaum, Joseph. 1976. *Computer Power and Human Reason*. San Francisco: W.H. Freeman.

Wittgenstein, Ludwig. 1961. *Tractatus Logico-Philosophicus*. (trans) D.F. Pears and B.F. McGuiness. London, Routledge & Kegan Paul.